

# MEMORANDUM

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**TO:** Allan Brouillet and Sue Kaelber-Matlock (Michigan DEQ)  
**FROM:** Hector Galbraith (GES)  
**DATE:** July 9, 2004  
**SUBJECT:** Dioxin/Furan sediment and soil guidelines

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As requested, I have reviewed the literature and information posted on the internet to identify non-U.S. guidelines or standards for PCDDs and/or PCDFs in freshwater sediments or terrestrial soils. I identified two sets of guidelines, in addition to one U.S. EPA set of numbers that I had not previously reported. These are discussed below.

## 1. The Netherlands

In 1996, the Committee on Risk Evaluation of Substances/Dioxins of the Health Council of the Netherlands a set of risk-based guidance values for 2,3,7,8-TCDD (Health Council of the Netherlands, 1996). These were developed following a thorough review of the scientific literature and the resulting concentration limits were intended to protect wildlife that might be exposed through food chains. Based on the results of their review, the Health Council of the Netherlands predicted that 2,3,7,8-TCDD concentrations greater than 13 ng/kg dw (ppt) in freshwater sediments and 2 ng/kg dw in soil could result in adverse effects among wildlife species. Although formulated by a government-sponsored body, these values are guidelines rather than standards. That is, they are intended to be used by government agencies for evaluation purposes, and are not concentration limits with legal force.

## 2. Canada

Under the Canadian Environmental protection Act and various provincial legislation, the Canadian Council of Ministers of the Environment (CCME) are tasked with developing environmental media contaminant guidelines that will be protective of human health and the environment. These Canadian Environmental Quality Guidelines are updated each year and posted on the internet at: <http://www.ec.gc.ca/ceqg-rcqe/English/ceqg/default.cfm>. For PCDD/PCDFs in agricultural land (which includes protection of wildlife) the numerical guideline is 4 ng/kg dw. This value is based on a review of the scientific literature and is risk-based. For freshwater sediments two values have been developed (based on the scientific literature and toxicity tests): the Interim Sediment Quality Guideline is that value below which adverse effects on sediment fauna are unlikely. This value is 0.85 ng/kg dw. The Probable Effects Level is that concentration above which adverse ecological effects are likely to occur and is 21.5 ng/kg dw.

As far as is known, the CCME guidelines are intended to assist Canadian federal and provincial agencies in evaluating the possibility of ecological risks, rather than acting as regulatory-imposed standards

### 3. U.S. EPA Region 5

In August, 2003 U.S. EPA Region 5 published soil and sediment ecological screening levels as part of its RCRA program (<http://www.epa.gov/reg5rcra/ca/ESL.pdf>). Except to state that the sediment levels were developed using the equilibrium partitioning approach, no details have been obtained on their methods of development. However, the PCDD sediment and soil levels are 11 and 0.199 ng/kg dw, respectively and the PCDF soil level is 38.6 ng/kg dw. These values are intended to provide guideline levels against which site-specific media data can be screened for ecological risk. By implication, site concentrations that exceed these values could incur risks to ecological receptors.

The soil and sediment values described above are summarized in Table 1.

<b>Table 1. Agency guidelines for PCDDs and PCDFs in soils and freshwater sediments.</b>				
<b>Agency</b>	<b>Contaminant</b>	<b>Medium</b>	<b>Guideline</b>	<b>Concentration ng/kg dw</b>
Health Council of the Netherlands	2,3,7,8-TCDD	Sediment Soil		13 2
CCME	PCDD/PCDF	Sediment	Interim Sediment Quality Guideline	0.85
		Soil	Probable Effect Level	21.5 4.0
U.S. EPA Region 5	PCDD	Sediment Soil	Ecological Screening Levels	11.0 0.199
	PCDF	Soil		38.6

### REFERENCES

Health Council of the Netherlands. 1996. Polychlorinated dibenzo-p-dioxins, dibenzofurans and dioxin-like polychlorinated biphenyls. Prepared by the Committee on Risk Evaluation of Substances/Dioxins. Publication no. 1996/10E.